Remotely Operated Underwater Vehicle (ROV)

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Blue ROV

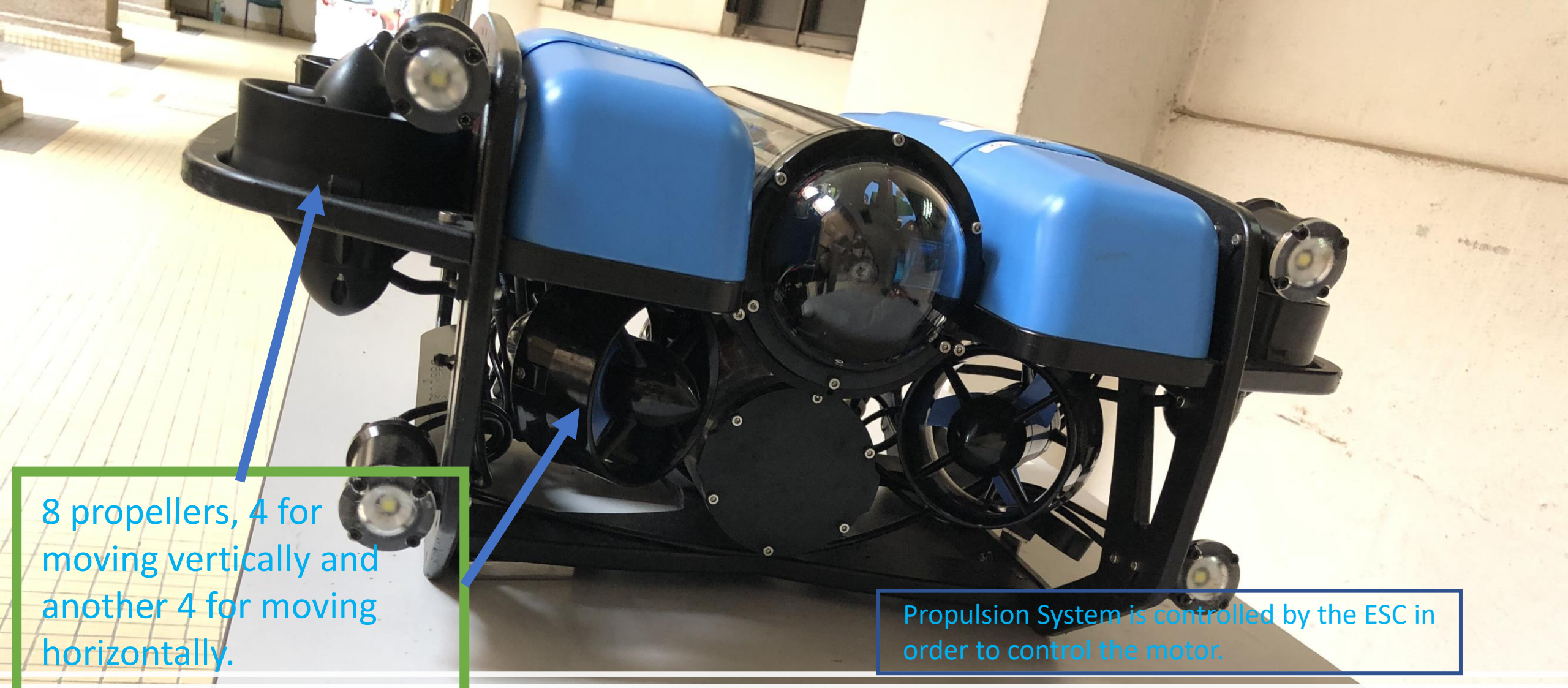
Created at CUTE IIUM.

Main components:

Hull Design (Robot Design)	Navigation System & Control	Data collection (Payload)	Data transmission (Communication)	Propulsion System

Hull Design (Robot Design)

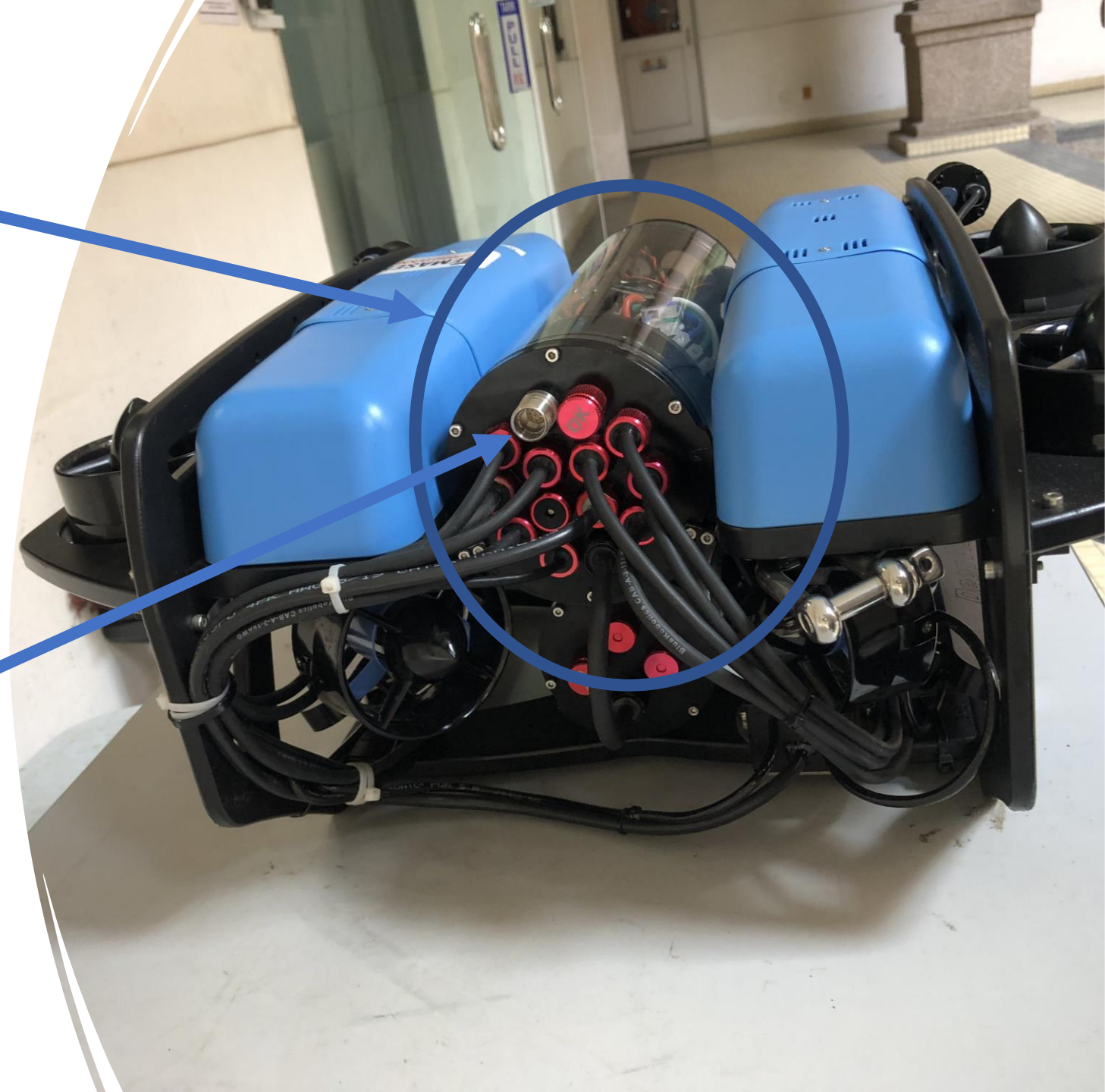
- Double rectangle shaped hull.
- The body is tested by IPX 8 water test condition, where the robot is submerged into 1.5meter depth in water for 30 minutes.
- IPX 8 water test condition is to protect the electrical system such as navigation system, data collection, data transmission and power management.



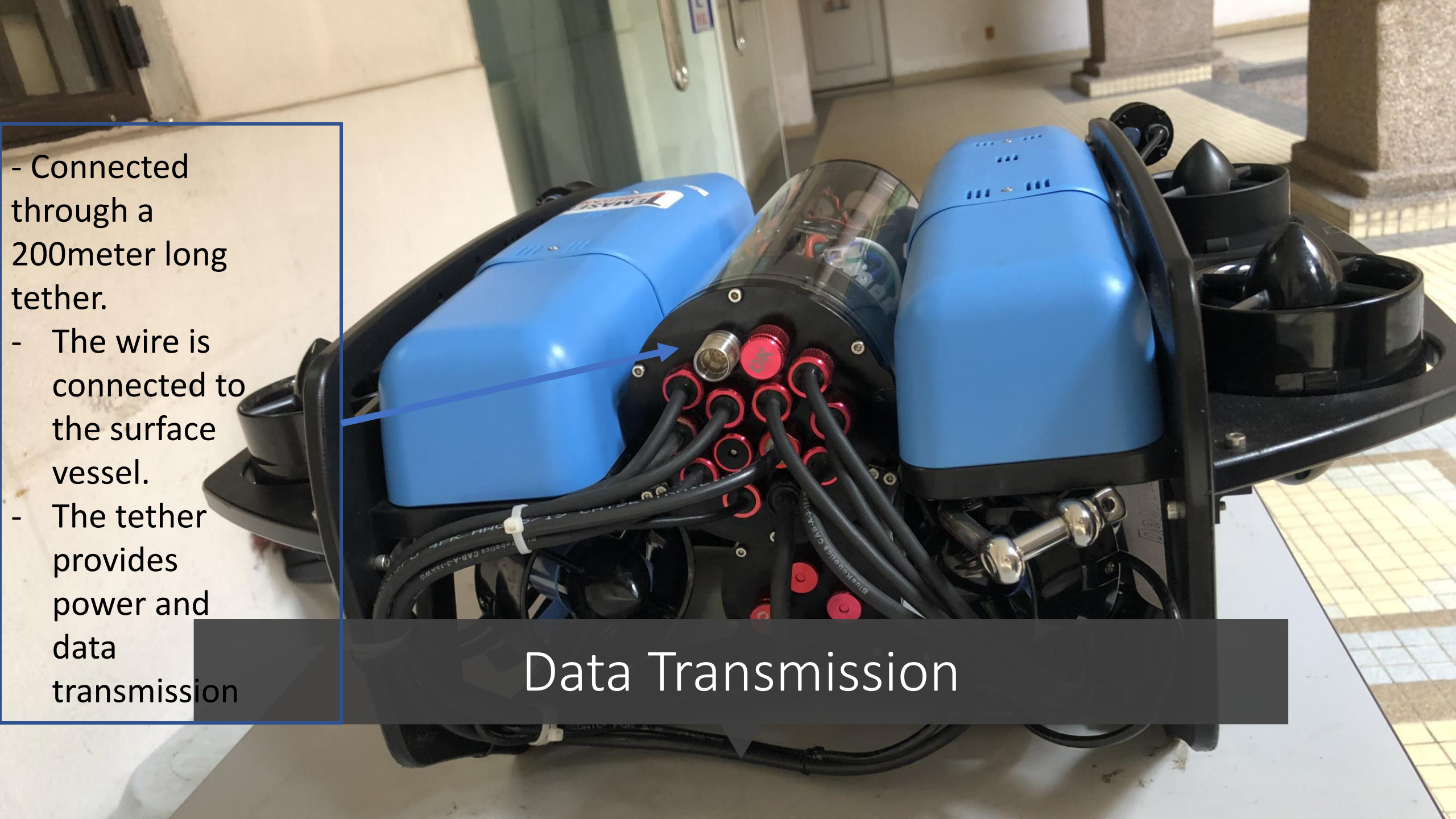
Propulsion System

Navigation System & Control

- Tether control, which involves maintaining a steady feed of tether length into the water.
- Controlled using joystick.
- The control system is based on an open-source autopilot called Ardupilot, which provides a customizable and flexible platform for controlling the ROV.
- Uses Raspberry Pi to load the data.
- Has a high-precision Attitude Heading Reference System that provides real-time orientation and position data.



Data Collections



- Connected through a 200meter long tether.
  - The wire is connected to the surface vessel.
  - The tether provides power and data transmission

Data Transmission

Power Management

- The Blue ROV is powered by a Lithium-ion battery pack that provides up to 2.5 hours of continuous operation.
- The battery pack is rechargeable and can be replaced for extended operations.
- The ROV also has a power management system that monitors and regulates the battery voltage, current, and temperature.
- The power management system also controls the power distribution to the thrusters, sensors, and other components, ensuring optimal power consumption and efficiency.

SEABER

- Created at CUTE IIUM
- Main components:
  - Hull Design (Robot Design)
  - Navigation System & Control
  - Data collection (Payload)
  - Data Transmission (Communication)
  - Propulsion System

Hull Design

- Submarine-shaped
- Compartmented in 2 sections
- The dry section is located in the middle and rear area is never to be opened by the user

Propulsion System

- Uses 1 propeller located at the rear.

Navigation System & Control

- Uses fin to change direction
- Has camera at the front of the body
- Controlled from a long distance using a remote control called SEACOMM
- The remote control displays SEABER GPS position when it is at the surface and includes the auto-pilot returning function
- 1 LED flashlight to easily spot the robot.

Data Transmission

- Equipped with 3 types of wireless communication antennas: satellite, GSM and radio.
- Accessible via WiFi through different platforms

Data Collection (Payload)

- The measurement devices are located at the nose of the robot which are accessible to users
- This nose section also includes necessary connectors, for quick plug & play integration of new sensors such as depth sensors